

Idaho Department of Environmental Quality
2110 Ironwood Parkway
Coeur d'Alene, ID 83814
December 12, 2005

From: Gary Stevens

Subject: Avery Landing
Soil, Ground Water and Surface Water Contamination and Remedial Efforts to Date
Avery, Idaho

This memorandum summarizes a review of site activities at the Avery Landing located in Shoshone County approximately one-half miles east of the city of Avery (Figure 1). There are a number of Hart Crowser (HC) reports regarding site characterization and remedial system design for the Potlatch Corporation. The EPA contracted URS Consultants, Inc. (URS) to determine if the site met the criteria for the placement on the National Priorities List.

General

Site Characteristics

The site is approximately 1,550 feet long and varies between 150 to 300 feet in width. The site is bordered to the south by the St. Joe River (River) and to the north by the St. Joe River Road. An upland area (Avery Hill) is located immediately north of the St. Joe River Road. The site appears to be underlain by approximately 18 feet of sand and gravel fill, from 18 – 30 feet of cemented gravel and below 30 feet alternating competent and fractured shale (Precambrian Belt Supergroup sediments). The fill is reported to be at least in part from grading activities performed by Potlatch after purchase of the property. Groundwater is located approximately 8-feet below ground surface and flowing approximately south toward the River.

There currently a number of monitoring/remediation wells completed on site. There is also reported one drinking water well (on-site residential well) on site that maybe used seasonally. There is also reportedly a cutoff trench and containment wall with recovery/treatment system.

The site is owned by the Potlatch Corporation. (Potlatch), Federal Hiway Administration and David Thierault. Based on the available documentation, the property ownership boundaries are unclear, but appear that Potlatch owns most of the contaminated property.

Site History

The site was used by the Chicago, Milwaukee, St. Paul and Pacific Railroad (CMSPR) from 1909 to approximately 1977. CMSPR site activities included train refueling, use of solvents for equipment maintenance and possible on-site storage of transformers (CMSPR was the nation's largest electrified railroad.)(URS, 1993). Potlatch purchased the property and since approximately 1980 used the site for staging, parking and temporary log storage. The site has been used by both the Federal Highway Administration and the State of Idaho for road construction/maintenance activities.

Site Investigation/Remedial Activities

Hart-Crowser has performed the site investigation and remedial activities at the site. There are a number of reports documenting activities at the site. The general investigation/evaluation and order of events are:

1. HC completes seven monitoring wells (HC1 – HC5, MW-5 and -11), three piezoimeters (P1-P3), 11- test pit monitoring wells (TP1-TP12), and four extraction wells (EW1 – EW4) (see Figure 2 for well location). The exact timing, sequence and construction of these wells are unknown based on the available documentation. Some wells have apparently been destroyed or made unusable.
2. Through the completion of subsurface explorations it is determined that there is a significant quantity of what appears to be Bunker C fuel oil at the ground water interface. It is reported that HC4 there was a 4-foot thick free phase product thickness.
3. The extent of the contaminated ground water can be seen in Figure 2. The ground water sampling mainly consisted of obtaining depth to ground water and the thickness of free product. The latest sampling event

results on record are for 6/14/00. There were two sampling events where purged ground water samples were obtained and sent to an analytical laboratory. The wells and sample results are shown in Table 1.

4. HC determined that in order to maintain the petroleum hydrocarbon on site a recovery system was proposed and constructed. The recovery system consisted of a down gradient cutoff trench with extraction wells completed in the trench. The cutoff trench would capture petroleum contaminated water and then pump the water through the extraction wells to an oil/water separator. The treated water would then be pumped to an upgradient location and reinjected into the ground water system through infiltration trenches. Apparently the product from the oil/water separator would be pumped to a separate holding tank for removal. (See Figure 2).
5. It appears based on the limited documentation that the recovery system would fail on a regular basis and failed to adequately maintain hydraulic control of the site, resulting in release of product to the River. As of March 2000 there is reported recovery of 775 gallons of the potentially 21,000 gallons of product.
6. A containment wall was then proposed and constructed between the cutoff trench and the River. The containment wall consisted of geomembrane, sand and gravel fill with riprap.
7. It currently appears that the extraction wells and recovery system are not operating and the containment wall is not containing product. A sheen/release has been recently reported on the River.

A separate report was completed by URS to determine if the site should be placed on the National Priorities List. The general investigation/evaluation and order of events are:

1. URS investigated potential receptors through groundwater, surface water, soil and air pathways through a limited sampling program. URS obtained ground water samples from both residential and onsite wells, on-site soil samples, site sediment seep samples and river sediment samples. All the samples were analyzed for VOC's, SVOC's, total metals, PCB's and pesticides.
2. The ground water samples obtained from residential wells indicate no contaminants of concern. The analytical results from the city of Avery well indicated no VOC's/SVOC's and is consistent with additional analytical results obtained for public drinking water supply requirements (DEQ Files). **The URS report indicates that no samples were collected from the on-site residential well nor of wells located west and potentially down gradient of the site.**
3. **The on-site monitoring well indicates the presence of VOC's, PAH's and inorganic analytes. The VOC's and SVOC's analytes sampled were limited. The benzene concentration exceeded IDTL values all other SVOC did not exceed IDTL values. None of the carcinogenic PAH's were analyzed for.**
4. The upstream and downstream sediment samples did not indicate significant contaminants of concern (URS).
5. Significant concentrations of contaminants of concern were found in the oily seep sediment sample (URS).

Recommendations

There are four impacted mediums; 1) ground water, 2) soil, 3) surface water and 4) river bed sediments. There needs to be a better characterization of the site that should include; 1) definition of the current lateral and vertical limits of contamination and 2) identifying the constituents of concern (COC's) present at the site and 3) the concentrations of the COC's.

Ground Water

1. I recommend that the existing monitoring well network be evaluated for location and well construction. If additional monitoring wells are necessary then 1) a licensed drilling contractor should be used, 2) monitoring wells should be constructed as required by IDWR, including the use of stand-up monuments with bollards (reports of monument flooding and failure to locate because of snow), 3) the drill cuttings should be logged by the consultant using standard ASTM descriptions and 4) all the wellheads should be surveyed to a common datum.
2. A round of ground water levels and samples should be obtained. The water samples should be analyzed for VOC's (EPA 8060), SVOC's with PAH's including 1-, 2-methylnaphthalene (EPA Full 8270 modified with SIMs for PAH's), and PCB's (EPA 8082).
3. Based on the results evaluate the acceptable REM Guidance values and Ground Water Rule standards (IDAPA 58.01.11.200.01).

Soil

1. I recommend that the existing soil sampling locations be evaluated for number and distribution to ensure proper site characterization. If additional soil sampling is required an environmental consultant should be subcontracted and soil samples should be obtained using an excavator and standard sampling protocols.
2. The soil samples should be analyzed for VOC's (EPA 8060), SVOC's with PAH's including 1-, 2-methylnaphthalene (EPA Full 8270 modified with SIMs for PAH's), and PCB's (EPA 8082).
3. Based on the results evaluate the acceptable REM Guidance values.

Surface Water

1. The stretch of the River that could be impacted by product at the site (P-27 of the St. Joe Subbasin) has the following designations 1) special resource water, 2) domestic water supply, 3) primary contact recreation, 4) cold water communities and 5) salmonid spawning.
2. Permanent upgradient and downgradient sampling stations should be designated.
3. The surface water samples should be analyzed for VOC's (EPA 8060), SVOC's with PAH's including 1-, 2-methylnaphthalene (EPA Full 8270 modified with SIMs for PAH's),
4. Evaluated for compliance with Water Quality Standards (IDAPA 58.01.02.210).
5. The surface water regulatory requirements may become the most stringent requirements driving the remedial effort.

Sediment

1. Removal/Treatment of contaminated river sediment. The proposed action will require the involvement of the Regional Sediment Evaluation Team utilizing the Dredged Material Evaluation Framework Guidance (USEPA/Army Corps of Engineers). It will also require close coordination with regulatory agencies and the need for permits for work below the ordinary high water mark or in wetlands.

Remediation

1. Remediation of this site most likely would involve:
 - a. Removal and remediation of source(s) (contaminated soil)
 - b. Hydraulically controlling the site (keeping contaminated ground water on-site)
 - c. Removal/Treatment of contaminated ground water
 - d. Removal/Treatment of contaminated river sediment
 - e. Adequate monitoring of ground water and surface water to evaluate remedial status and ensure containment of contaminated material on-site.
2. The remedial options for Bunker C fuel oil are limited and generally include the following ex-situ methods:
 - a. Excavation of source material and transport to an acceptable landfill
 - b. Excavation of source material with landfarm treatment in a lined cell
 - c. Excavation of source material with incineration

The owner/client should perform a cost/benefit analysis to determine what maybe the best option. I would not recommend in-situ methods for this site given the contaminant and subsurface conditions. The site documentation indicates that phytoremediation efforts have failed and additional attempts most likely should not be attempted. There is documentation which suggests that the site not be filled with imported material but should be returned to pre-site development conditions with elevations and vegetation consistent with a floodplain. If this condition is chosen then the remediated soil would be transported off-site.
3. Other constituents of concern that maybe in the soil and ground water may dictate the remedial options and should be assessed and considered.
4. Hydraulic control of the site should be maintained through the use of **BOTH** dewatering wells and the containment barrier. The dewatering wells will most likely have contaminated water. The containment barrier will limit the amount of water produced and treated/disposed. A hydrogeologic evaluation should be performed using data from the HC and URS reports to determine the amount of ground water that could flow through the site from both precipitation events and re-injection of treated water (see below). The number and distribution of wells should be determined that could remove and maintain water levels on-site that would be below River levels at all times.

The current remedial design treats the water through an oil/water separator and then re-injects that water into an up gradient infiltration trench (see figure 2). Given the potential quantity of water produced and the lack of disposal options this may be the only alternative. The city of Avery does not have sewage treatment

only large septic drain field. The treatment of contaminated water and monitoring of the re-injected water quality is imperative.

There are two culverts which drain runoff from the adjacent upland areas onto the surface of the site (Figure 3). The culverts should be diverted off-site to reduce the amount of water flowing through the soil and possibly reduce the leaching of product to the ground water. The following entities would most likely be involved:

- a. Federal Highway Administration
 - b. Idaho Department of Transportation
 - c. Shoshone County
 - d. Regulatory Agencies (permits)
5. The treatment/disposal of pumped water will depend on the constituents present. **An oil/water separator may be adequate for Bunker C and/or diesel, but not be effective for lighter end dissolved organic solvents.** Proper identification and quantification of ground water contaminants is necessary to determine the proper method and level of pumped water treatment. Depending on the treatment method/level an air quality permit may be required.
 6. The remediation of river sediment would be the same as for contaminated soil. Because of the disturbance to the river bed below the ordinary high water mark, the following group/agencies should be involved:
 - a. DEQ Coeur d'Alene Regional Office Surface Water Group
 - b. U.S. Army Corps of Engineers
 - c. Idaho Department of Water Resources
 - d. Idaho Department of Fish & GameThe proper permits and notification should be obtained before initiating sediment remediation.
 7. Ground water levels and samples should be obtained on a minimum quarterly basis until the remediation effort is completed.
 8. Surface water samples should be obtained on a schedule dependent on the proposed remediation plan
 9. An evaluation should be complete to see if the on-site residential well would be considered a non-community system and needs to comply with water sampling and analysis requirements, also a possible GUDI designation.
 10. Given the potential complexity and agency/public participation I would recommend a DEQ Avery Landing Group be initiated and include representatives from all or some of the following groups:
 - a. Waste & Remediation
 - b. Ground Water
 - c. Surface Water
 - d. Attorney Generals Office
 - e. Engineering (Drinking Water)
 - f. Air Quality

Containment

If Potlatch wishes to only contain the contamination on site and not remediate then:

1. Number 4 as seen under the Remediation Section
2. The remediation of River sediments would still be a requirement as (Remediation Section #6) this would be a constant source of contaminants to the River.
3. Monitoring of water levels along with regularly scheduled ground and surface water samples would be imperative. The monitoring should be performed at the property boundaries to demonstrate that the contamination is restricted to Potlatch Property

These comments are from a limited review. A more complete and thorough review may indicate other issues for consideration.

Table 1. Historic Ground Water Analytical Results

ARDR Site Historical Sample Data

Parameter	Water Sample Collected July 26, 1989, from MW-11	Purged Water Sample Collected August 23, 1989, from HC-3	Purged Water Sample Collected August 23, 1989, from HC-4
Arsenic	NA	0.009 ppm	ND
Cadmium	ND	ND	ND
Chromium	20 ppm	ND	1 ppm
Lead	30 ppm	ND	5 ppm
Total Petroleum Hydrocarbons	ND	ND	ND
PCB	1.4 ppm	NA	NA

Source: Hart-Crowser 1989a, Hart-Crowser 1989b

Notes:

NA - Not analyzed

ND - Not detected

ppm - parts per million

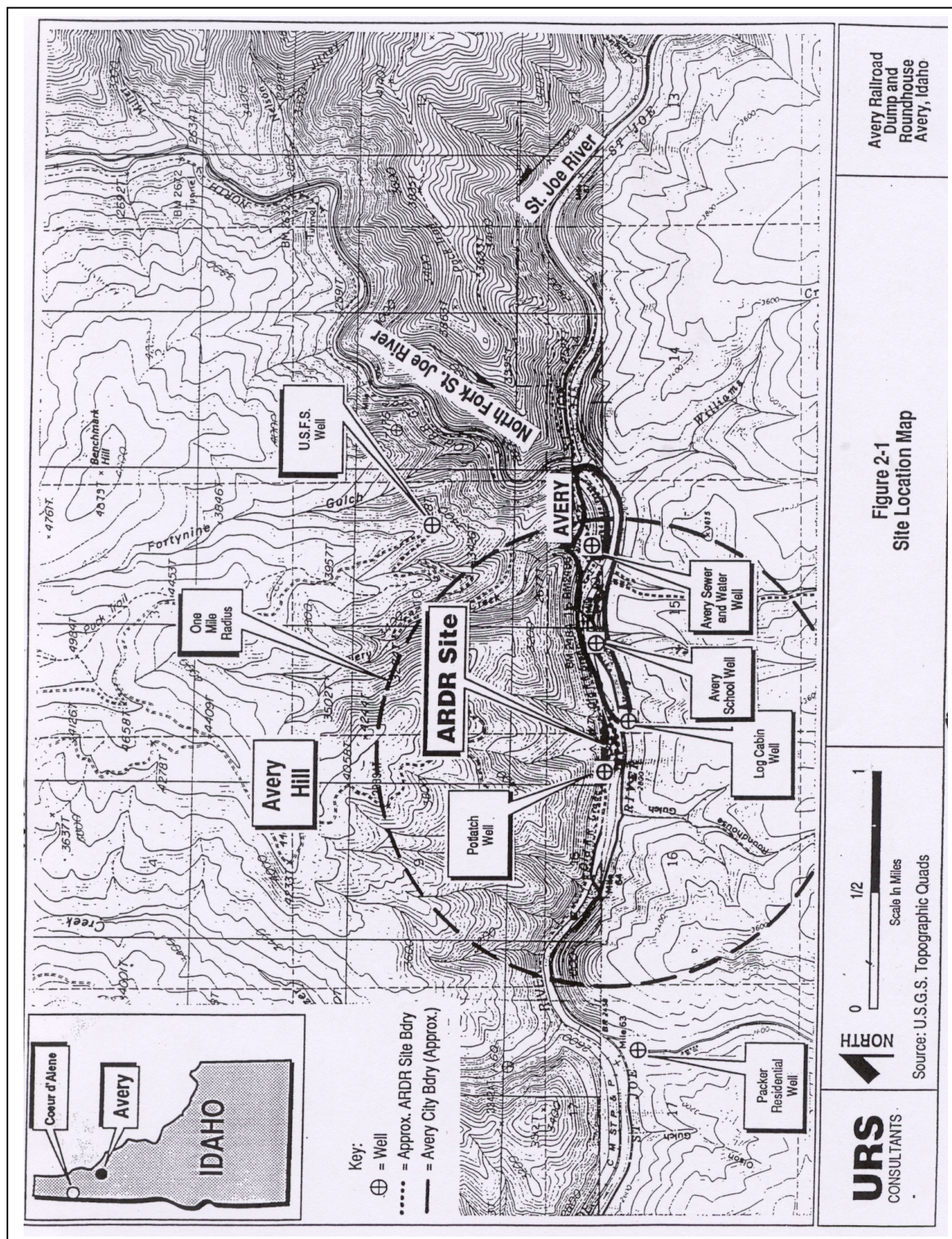


Figure 1. Avery Landing Vicinity Map

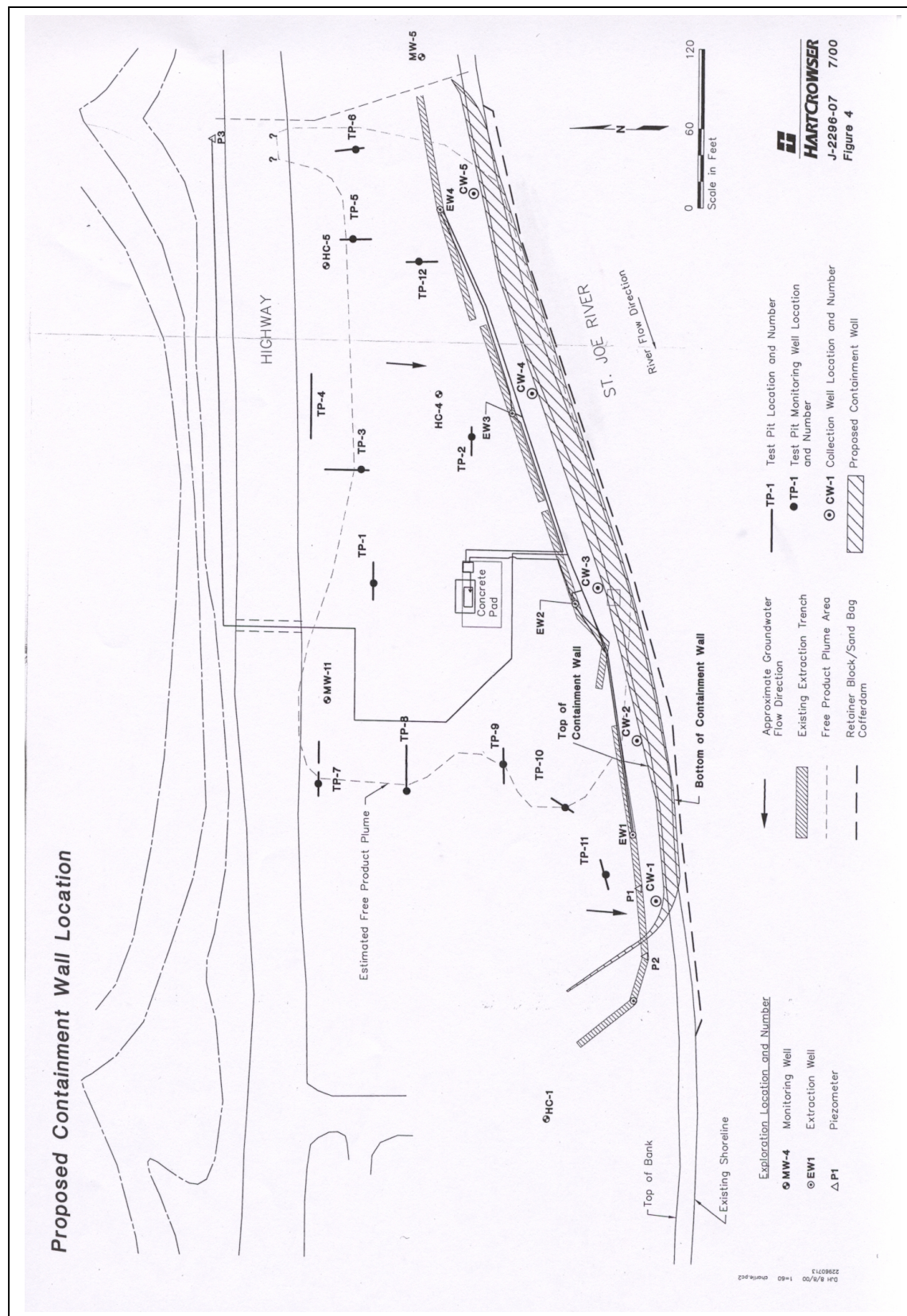


Figure 2. Monitoring Well, Excavation Trench and Containment Wall Location Map

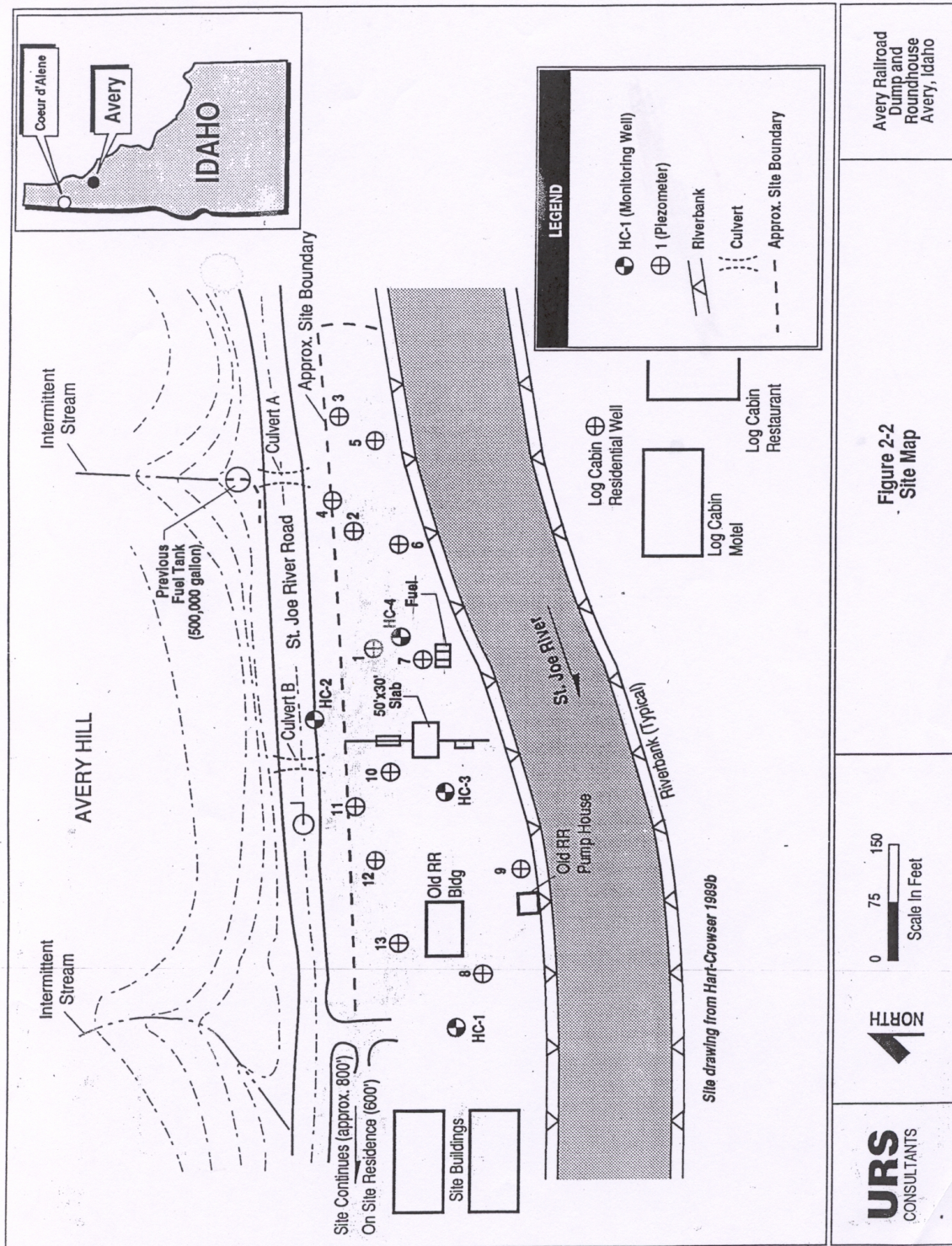


Figure 3. Avery Hill and Culvert Location Map